

**State of California
AIR RESOURCES BOARD**

**Research Screening Committee Meeting
Cal/EPA Headquarters Building
1001 I Street
Training Room 5
Sacramento, California 95814
(916) 445-0753**

**March 21, 2008
9:00 a.m.**

ADVANCE AGENDA

Responses to Requests for Proposals

1. "Lifecycle Analysis of High-Global Warming Potential Greenhouse Gas Destruction,"
\$300,000, RFP No. 07-330
 - a. Caleb Management Services, Ltd.
\$296,917, Proposal No. 2662-260
 - b. ICF International
\$297,765, Proposal No. 2660-260
 - c. Institute for Research and Technical Assistance
\$298,090, Proposal No. 2661-260
 - d. PE Americas
\$298,900, Proposal No. 2659-260
 - e. TIAX, LLC
\$295,448, Proposal No. 2663-260

High-Global Warming Potential (GWP) greenhouse gases (GHG) found in refrigerants, insulating foam, and stockpiled Ozone-Depleting Substances represent a significant source of potential emissions of GHGs. A need exists for an energy-efficient, cost-effective strategy to mitigate the potential GHG emissions from these materials. The purpose of the proposed research is to generate a lifecycle analysis (LCA) for the recovery and destruction options for High-GWP GHGs in order to develop and recommend the most cost-effective and practical approaches to emission reductions. Options explored are not limited to destruction of recovered materials, but may also include re-use and recycling of recovered High-GWP GHGs. The LCA project will complement two existing High-GWP GHG inventory and emission projects without duplicating their efforts. The two inventory projects will provide information on the sources, inventories, and emissions from High-GWP GHGs, and the results of this

proposed LCA project will build on the inventory information, to ultimately help the Air Resources Board (ARB) refine carbon dioxide equivalent GHG emissions control strategies currently being developed, in terms of costs/benefits. The study will also help to identify as well as prioritize new mitigation opportunities, so that those presenting the greatest benefits receive the most attention.

Interagency Proposals

2. "Systemic Platelet Activation in Mice Exposed to Fine Particulate Matter," University of California, Davis, \$251,834, Proposal No. 2658-260

The majority of air pollution-related adverse health impacts, particularly cardiovascular effects, are associated with particulate matter, but biological mechanisms identified to date do not fully explain how particulate matter (PM) could cause these effects. Several recently published studies suggest that PM may alter function of the vascular endothelium and blood platelets, both of which are involved in control of cardiovascular function. The objective of this proposal is to investigate the potential for fine particles to alter pulmonary vascular endothelial platelet function in ways that promote blood clotting. The ambient air quality standards for particulate matter are based on statistical associations between particulate matter and health endpoints, with little strongly supporting biological data. The results of the proposed study will help to address the inconsistencies and gaps in available mechanistic data supporting the biological validity of the observed epidemiologic associations.

Draft Final Reports

3. "Hourly, In-Situ Quantitation of Organic Aerosol Marker Compounds," University of California, Berkeley, \$369,149, Contract No. 03-324

Regulatory efforts to attain fine particulate matter (PM_{2.5}) standards require improvements in our knowledge of the factors controlling the concentration, size, and chemical composition of PM_{2.5}. Quantitative knowledge of the composition of PM_{2.5} organic matter is a key to understanding its sources, formation, and transformation processes. The research described in the final report presents results from two intensive study periods: summer and fall 2005 in Riverside, California. The concentrations of organic marker compounds were measured with hourly time resolution and analyzed by principal component methods to provide hourly source attribution. Measured compounds included alkanes, phenols, alkanals, sugar derivatives, polycyclic aromatic hydrocarbons, and mono-carboxylic acids. Some of these compounds are markers for primary emissions such as combustion sources, while others are secondary products formed from anthropogenic or biogenic precursors. The variation in organic composition throughout each study period, along with other hourly data sets, was used to identify the relative contributions of local vehicles, regional anthropogenic particulate emissions, biomass burning, biogenic sources, and secondary organic matter. This research has provided new data of immediate value for the development of air quality attainment strategies and the State Implementation Plan for PM.

4. "Ventilation and Indoor Air Quality in New Homes," Indoor Environmental Engineering, \$1,139,796, Contract No. 04-310

Concerns have been raised regarding whether households in new California homes use windows, doors, exhaust fans, and other mechanical ventilation devices enough to remove indoor air pollutants and excess moisture. The goal of this field study was to measure, and analyze the relationships between, ventilation characteristics and indoor air quality in new, single-family detached homes in California. Information was obtained from 24-hour measurements in 108 homes in multiple seasons and regions of the state to help characterize the full range of indoor pollutant exposure in such homes. A subset of homes with outdoor air mechanical ventilation systems was also studied. The study results indicate that two-thirds of the homes did not meet the proposed State minimum for outdoor air exchange rates. Indoor levels of formaldehyde exceeded the ARB's guideline of $33 \mu\text{g}/\text{m}^3$ (27 ppb) for preventing acute health effects in 59 percent of the homes. Indoor levels of acetaldehyde exceeded the guideline of $9 \mu\text{g}/\text{m}^3$ for preventing chronic non-cancer effects from acetaldehyde in 82 percent of the homes. In addition, all or nearly all of the homes had indoor levels of formaldehyde or acetaldehyde, respectively, that exceeded the Proposition 65 No Significant Risk Level for lifetime cancer risk. Indoor levels of other pollutants did not exceed current guideline levels. Over 80 percent of the homes with the direct outdoor air type of mechanical ventilation system did not meet the California Energy Commission's (CEC) proposed standard for outdoor air exchange, due to short ventilation times and undersized intake ducts. CEC co-funded this study, and will use the results to help revise ventilation requirements and compliance programs for the State's building energy efficiency standards. ARB will use the results to update its assessments of Californians' exposures to toxic air contaminants and other pollutants, and to recommend effective strategies for reducing indoor air pollution.